LEED Credit	Intent	Requirement	LEED Points	AF Policy	Justification	Planning	Programming	Approvals	A/E Selection	Contract	Concept Design	Design Development / Documentation	Bidding and Award	Construction and Commissioning	Operations and Maintenance	Measurement and Verification
Sustaining Sites																
Site Prerequisite 1: Erosion and Sediment Control	Control erosion to reduce negative impacts on air and water quality	Design a site sediment and erosion control plan that conforms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-833-R-92-001, Chapter 3, OR local Erosion and Sediment Control standards and codes, whichever is more stringent. The plan shall meet the following objectives: > Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse. > Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.	LEED req	**highly recommended**	Provides a standard for best practice site design where local codes and standards for Erosion and Sediment Control are insufficient. This standard prevents topsoil from being washed off site, and protects slopes from erosion and destabilization, thereby protecting watersheds from excess sediments and nutrients.		Review local Erosion and Sedimentation Control standards and codes against LEED referenced EPA document, to determine which is more stringent. If EPA guidelines are more stringent, it is highly recommended that the EPA guidelines be adopted as a project requirement. Provide written justification if lesser standard is adopted.	Verify that EIAP documentation is consistent with erosion and sediment control standards adopted for use.		Document site sedimentation and erosion control requirements in SOW.	Consider erosion and sediment control requirements as the site plan is developed to minimize potential conflicts between construction phase requirements and the final site design. Document preliminary erosion and sediment control strategy in the **Sustainable Design Report**.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Declare whether projects follows local erosion and sediment control standards or the referenced EPA standards and provide brief listing of measures implemented. If local standards are followed describe how they meet/exceed EPA BMPs. **AND** Provide the erosion control plan (or drawings and specifications) with sediment and erosion controls measures highlighted.	Certify contractors on sediment and erosion control plan implementation. **AND** If Erosion and Sediment Control standards adopted for use are more stringent than local standards and codes, highlight this in the pre-bid conference.	Inspect erosion and sedimentation control plan at construction site and adjust as necessary. Verify that needless clearing of trees and grading does not occur, waterways are protected, steep slopes and drainage ways are stabilized, and construction is phased to limit soil exposure.	Maintain dense native vegetation cover on all pervious surfaces. **AND** Conduct maintenance walks to inspect drainage outlets and clean out as necessary. Install and maintain sandbags and/or filter systems around drainage outlets. **AND** Assess erosion and sedimentation control practices after storm events to ensure its proper functionality.	
Site Prerequisite 2 (AF Amendment): Environmental Protection	**AF Amendment:** Maintain environmental integrity of natural areas.	**AF Amendment:** Meet requirements of the National Environmental Policy Act (NEPA), Underground Storage Tank (UST) regulations, and all related state and local laws .	required	**required**	This is a regulatory requirement. Compliance is mandatory.		Identify compliance with NEPA and UST as project requirements during the programming phase, and develop list of applicable state and local environmental protection laws that also must be met.			Identify compliance with NEPA and applicable state and local requirements as a project requirement in the SOW.	Consider NEPA requirements and applicable state and local laws as the site plan is developed. Document compliance strategy in the **Sustainable Design Report**.	Document compliance with NEPA requirements and applicable state and local laws				
Site Prerequisite 3 (AF Amendment): Cultural Resources Protection	**AF Amendment:** Maintain historical and cultural integrity of the structures and surrounding areas.	**AF Amendment:** Meet requirements of the National Historic Preservation Act.	required	**required**	This is a regulatory requirement. Compliance is mandatory		Identify compliance with National Historic Preservation Act as a project requirement during the programming phase.	Check with the Cultural resources master Plan (CRMP) to ensure that structures/sites of cultural/historic significance are not affected adversely by the project; if a structure/site has not been inventoried, schedule a cultural survey prior to groundbreaking.		Identify compliance with National Historic Preservation Act as a project requirement in the SOW.	Consider National Historic Preservation Act requirements as the concept design is developed. Document compliance strategy in the **Sustainable Design Report**.	Document compliance with National Historic Preservation Act requirements	Describe historic and cultural features that must be maintained in the pre-bid conference.	Perform construction in a manner consistent with the base level Cultural Resources Management Plan (CRMP), where applicable.		
Site Prerequisite 4 (AF Amendment): Clean Water Protection	**AF Amendment:** Maintain environmental integrity of all water resources that are impacted by the construction and operations of the building and sitework.	**AF Amendment:** Meet requirements of the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), and all related state and local laws.	required	**required**	This is a regulatory requirement. Compliance is mandatory		Identify compliance with CWA and SDWA as project requirements during the programming phase, and develop list of applicable state and local clean water laws that also must be met.			Identify compliance with Clean Water Act and applicable state and local requirements as a project requirement in the SOW.	Consider Clean Water Act requirements and applicable state and local laws as the site plan is developed. Document compliance strategy in the **Sustainable Design Report**.	Document compliance with the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), and all related state and local laws.				
			14 total													
Site Credit 1: Site Selection	Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.	Do not develop buildings on portions of sites that meet any one of the following criteria: 1. Prime agricultural land as defined by the Farmland Trust 2. Land whose elevation is lower than 5' above the elevation of the 100 year flood as defined by FEMA. 3. Land that provides habitat for any species on the Federal or State threatened or endangered list.	1	**highly recommended**	Protects valuable public assets such as agricultural land, habitat for threatened or endangered species, wetlands and parkland. Protect against future damage from flooding. **SEE ALSO:** AFI 32-1021, C2	During site selection, identify options that are in conflict with the LEED criteria for Site Selection as "not preferred". Promote use of preferred sites, and provide written justification for use of those that are not preferred.							Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Declare that the project site does not meet any of the prohibited criteria.				

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		4. Within 100 feet of any wetland as defined by 40 CFR Parts 230-233 and Part 22, OR as defined by local or state rule or law, whichever is more stringent. 5. Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public land owner. (Park Authority projects are exempt.)														
Site Credit 2: Urban Redevelopment	Channel development to urban areas with existing infrastructure, protecting greenfields and preserving habitat	Increase localized density to conform to existing or desired density goals by utilizing sites that are located within an existing minimum development density of 60,000 square feet per acre (2 story downtown development).	1	**recommended**	Sites with existing infrastructure generally reduce project cost, vehicle miles of travel between housing and work, as well habitat loss and fragmentation. However infill sites may not be available in all localities. **NOTE:** potential conflict with *Anti-terrorism Guidelines*. **SEE ALSO:** AFI 32-1021; AFI 32-7062	During site selection, give priority to infill sites that meet LEED requirement for Urban Redevelopment without compromising Force Protection requirements. **OR** Consider modification of Base Comprehensive Plan to allow for increased density to meet LEED requirement, where appropriate.						Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide an area plan with the project location highlighted and the calculated development density for both the project and the surrounding area.				
Site Credit 3: Brownfield Redevelopment	Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.	Develop on a site classified as a brownfield and provide remediation as required by EPA's Brownfield Redevelopment program requirements.	1	**conditionally recommended**	Improvement of brownfield sites transforms negative assets, while also reducing pressure on undeveloped land. EPA funding may be available to support remediation and development. This credit is intended to encourage/reward the selection of sites that require remediation, which means that it will only be available for sites that are contaminated.	During site selection, consider sites that meet the LEED requirement for Brownfield Redevelopment. If a brownfield site is selected, budget for remediation in form 1391.		Secure approvals for brownfield and remediation assessment; see http://www.epa.gov/brownfields/ for guidance. **AND** Conduct EIAP process in accordance with NEPA guidelines.	Request that A/E identify environmental consultant for remediation activities, if needed.	Document remediation requirements in SOW.		Coordinate site design with recommendations of the Environmental consultant regarding any constraints presented by the site contamination and remediation effort. **AND** Consider bio-remediation (air sparging and soil venting) or phyto-remediation alternatives instead of groundwater pump and treat strategies or soil excavation. Document approach to remediation in the **Sustainable Design Report.**	Certify that contractors have required pollution liability insurance and have successfully completed OSHA hazardous waste training and certification. **AND** Require contractors to have demonstrated experience in responsible construction practices to protect human health and avoid cross contamination and/or extension of contamination plumes.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a letter from local regulatory agency or regional EPA office confirming that that the site is classified as EPA brownfield site. **AND** Provide documentation demonstrating that remediation efforts have been performed on site to clean or stabilize contaminants.		
Site Credit 4.1 Alternative Transportation	Reduce pollution and land development impacts from automobile use.	Locate building within 1/2 mile of a commuter rail, light rail or subway station; or within 1/4 mile of 2 or more bus lines.	1	**recommended**	Location of facility with proximity to rail, subway and buses reduces reliance on the automobile, and provides transportation alternatives. However, this credit will not be available in all locations. **NOTE:** potential conflict with *Anti-terrorism Guidelines*.	During site selection, look for opportunities to meet LEED requirement for proximity to transit. Identify transit options for each site under consideration..		Coordinate EIAP with transit strategy.				Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide an area drawing highlighting the building location, the fixed rail stations and bus lines, and indicate the distances between them. Include a scale bar for distance measurement.				Verify that transit options originally identified remain active.
4.2		Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for 5% or more of building occupants.	1	**highly recommended**	Accommodation for bicycle commuters promotes transportation alternatives, and can reduce reliance on the automobile. Bicycle facilities are appropriate for all building types and locations.		It is highly recommended that the programming effort include space to accommodate bicyclists. During requirements analysis, identify project requirements for convenient bike storage and change/shower facilities based on the anticipated occupancy.	Coordinate EIAP with bicycle commute strategy.			Design efficient, easily accessible, user-friendly and secure bicycle storage and showering/changing facilities to encourage usage. Describe approach for accommodating bicyclists in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide drawings and specifications highlighting bicycle securing apparatus and changing/shower facilities. Include calculations demonstrating that these facilities accommodate 5% or more of building occupants.		Ensure regular cleaning of showering/changing facilities to maintain usage and user satisfaction. Make sure that means for securing bikes is placed in an accessible and well lit area. Provide up-to-date "buddy lists" for biking to work.	Verify that bicycle racks or other devices to secure bicycles, and changing/shower facilities continue to be available. Review usage patterns and consider additional facilities if appropriate.

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4.3		Install alternative-fuel refueling stations for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors.	1	**recommended**	Integration of refueling stations for alternative fuel vehicles supports the market for alternative vehicles, and reduces air and water pollution from vehicle exhaust. May not be readily usable in all locations, however installation of alternative fuel refueling stations builds in future flexibility.		During programming, consider opportunities to install alternative fuel refueling stations to meet the LEED requirement. Review base policy regarding use of alternative fuel vehicles on site, and explore bio-diesel as alternative fuel for all heavy duty trucks and base vehicles .	Coordinate EIAP with alternative fuel vehicle strategy.			Consider options for use of alternative fuel refueling including: electric vehicles, compressed natural gas for fuel cells, or 8020 bio-diesel mix for all heavy duty trucks (does not require conversion to diesel engines). See http://www.worldenergy.net/ see also http://www.biodiesel.org/ **AND** Locate alternative-fuel stations so they are clearly marked, easily accessible and secure. Describe approach for accommodating aternative fuel vehicles in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide site drawings and specifications highlighting alternative -fuel refueling stations. Include information on venting if applicable. **AND** Provide calculations demonstrating that these facilities accommodate 3% or more of the total vehicle parking capacity.		Include alternative fuel refueling stations into the commissioning plan.	Provide regular maintenance of facilities to protect against accidental releases and to make sure the ventilation systems are operating properly. Clearly mark the alternative fuel stations/fuel type.	Verify that alternative-fuel refueling stations continue to be available. Review usage patterns and consider additional stations if appropriate.
4.4		Size parking capacity not to exceed minimum local zoning requirements AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants, OR, add no new parking for rehabilitation projects AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants. **AF Amendment:** Refer to AFH 32-1084, Facility Standards, instead of local zoning for parking capacity requirements.	1	**recommended**	Reduction of overall parking capacity can contribute lessen reliance on the automobile, while also decreasing imperviousness and stormwater runoff. Reduction in parking capacity needs to be balanced against a comprehensive assessment of transportation options. **SEE ALSO:** AFH 32-1084		During programming consider opportunities to meet LEED requirement. Review parking requirements against AFH 32-1084, Facility Standards, and make commitment to designate preferred parking for carpools and vanpools. Provide written statement if LEED referenced parking goals cannot be met.	Coordinate EIAP with parking reduction and carpooling / vanpooling strategy.			Locate all parking areas, including preferred parking spaces for carpooling and vanpooling on the site plan. Review design to confirm that roadway and parking design is efficient to minimize creation of impervious surfaces, and is coordinated with landscape design and stormwater management planning. Consider use of pervious paving for overflow parking. Provide narrative discussion of parking issues in the Sustainable Design Report.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a design narrative, parking plan, and company literature demonstrating that carpool and van pool programs serve 5% of the building occupants. **AND** For new projects, provide a copy of the local zoning requirements highlighting the criteria for minimum parking capacity. Provide a parking plan highlighting the total parking capacity. **OR** For rehabilitation projects, provide a pre-rehabilitation parking plan and a post -rehabilitation parking plan demonstrating that no new parking capacity was added.		Verify that preferred parking spaces for carpooling and vanpooling are properly marked.		Verify that parking capacity and carpooling strategy has remained as designed. Review usage patterns and consider additional preferred spaces for carpooling if appropriate.
Site Credit 5.1: Reduce Site Disturbance	Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.	On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond pervious paving areas that require additional staging areas in order to limit compaction in the paved area; **OR**, on previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation.	1	**conditionally recommended**	Reduction / elimination of impervious areas lessens site disturbance and facilitates site restoration of existing sites. Benefits include reduced ambient air temperature on the site, protection and conservation of open space, and restoration of habitat and biodiversity. Sustainable design benefits need to be balanced against cost and program requirements for parking and/or plazas.		Identify reduced site disturbance as a project goal for greenfield sites, and site restoration as a goal for previously built sites.	Coordinate EIAP with limited site disturbance strategy.			Develop site evaluation prior to the charrette, that provides an inventory of plant and animal species, and identifies critical habitats. Explore opportunities to meet LEED goal for reduced site disturbance, including reduced surface parking and/or pervious paving. **OR** on previously built sites, explore opportunities to maximize area available for open space, and meet LEED referenced goal for site restoration. Provide a narrative describing approach taken in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** On green fields provide site drawings and specifications highlighting limits of construction disturbance. **OR** on previously developed sites provide a narrative describing restoration and revegetation of degraded habitat areas. Include highlighted site drawings with area calculations demonstrating that 50% of remaining open areas have been restored.		Verify that needless clearing of trees and grading does not occur. Mark tree save areas and rope off other areas to remain undisturbed and hydrologically intact during construction.	Maintain native vegetation cover of all pervious surfaces. Ensure that pervious parking surfaces are plowed with care to maintain structural integrity and infiltration rates over time. Create strategic construction roads in order to reduce disturbance to the site.	

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5.2		Reduce the development footprint (including building, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%. **AF Amendment:** Reduce the development footprint to exceed the base requirements by 25%. For bases without open space requirements, base civil engineer shall set a target open space ratio to serve as the baseline.	1	**recommended**	Increased proportions of open space on the site reduce imperviousness, thereby improving water quality, groundwater recharge, and potential habitat for wildlife. To realize full benefit of increased open space use of low maintenance native vegetation is preferred. Potential benefits can be offset by high cost and environmental impacts if open space is developed as "lawn area" that requires irrigation, fertilizers and pesticides. **NOTE:** potential synergy with *Anti-terrorism Guidelines*.		Identify compact development solutions as a project goal, to maximize potential for open space on the site, and to support Force Protection Guidelines.	Coordinate EIAP with open space strategy.			Explore design strategies that preserve open space on the site, including buildings with smaller footprints, minimum width of roads and reduced areas dedicated to parking. Document approach to preserving open space in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report**: Provide a copy of the base requirements highlighting the criteria for open space. **AND** provide highlighted site drawings with area calculations demonstrating that the building footprint is smaller and therefore exceeds the local zoning for open space requirement by 25%. For areas without local zoning requirements (military bases), designate open space area adjacent to the building that is equal to the building footprint. Provide a letter from the owner/base manager stating that open space will be conserved permanently for the life of the building.		see above	see above	
Site Credit 6.1: Stormwater Management	Limit disruption of natural water flows by minimizing stormwater runoff, increasing on-site infiltration and reducing contaminants	Implement a stormwater management plan that results in: no net increase in the rate or quantity of stormwater runoff from existing to developed conditions; **OR**, if existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff.	1	**recommended**	On-site stormwater management reduces negative impacts on watersheds and aquatic life, and contributes to groundwater recharge. If integrated into the design at the beginning of site design, and sufficient land area is available, natural stormwater management systems can be developed cost-effectively.		Identify low-impact site development strategies and on-site stormwater management as a project goal.	Coordinate EIAP with stormwater management strategy.	Request that A/E team select Civil Engineer and Landscape Architect with demonstrated experience in low-impact site design and natural stormwater management systems. Consultants shall demonstrate their ability to collaborate, and to develop integrated design solutions incorporating landscape and on-site stormwater management strategies.		Analyze the geology and hydrology of the site prior to the design charrette. **AND** Explore potential for low-impact site design strategies for on-site stormwater management, to meet LEED requirement. Consider use of vegetated swales, bioretention, ponds, vegetated roofs, etc. to control runoff. See Center for Watershed Protection at www.cwp.org and 2000 Maryland Stormwater Design Manual http://www.mde.state.md.us/environment/wma/stormwatermanual/ Document stormwater management strategy in **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** For sites with less than 50% imperviousness, provide pre-construction and post-construction site drawings. Include area calculations demonstrating no net-increase in imperviousness on the site; **OR** For sites with greater than 50% imperviousness, provide a copy of the stormwater management plan. Include calculations describing how the measures of the plan decrease net imperviousness of site by 25% over existing conditions.		Rope off portions of the site that are to remain undisturbed and hydrologically intact during construction.	Inspect stormwater structures to determine if they are functioning properly. Water color and visibility are good indicators of whether ~~it~~ the system is working as intended. Conduct scheduled assessment of stormwater system.	Verify that Stormwater Management system continues to function as designed.
6.2		Implement a stormwater management plan that results in: treatment systems designed to remove 80% of the average annual post development total suspended solids (TSS), and 40% of the average annual post development total phosphorous (TP), by implementing Best Management Practices (BMPs) outlined in EPA's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (EPA 840-B-92-002 1/93).	1	**recommended**	Localized low impact development strategies can improve the quality of stormwater leaving the site thereby reducing negative impacts on watersheds and aquatic life. These strategies can also reduce the cost and liability of large scale stormwater infrastructure. If integrated into the design at the beginning of site design, and sufficient land area is available, natural stormwater management systems can be developed cost-effectively.	Explore potential Pollution Prevention (P2) funds that may be available for low-impact stormwater initiatives which contribute to P2 goals.	Identify low impact site development strategies and on-site stormwater management as a project goal.				Optimize site plan to reduce stormwater runoff and develop integrated strategies that increase groundwater recharge. Research annual rainfall, and calculate stormwater runoff from the site, both pre- and post-development to determine if LEED criteria can be met. Develop preliminary calculations and a narrative description of the approach in the **Sustainable Design Report.** <see EPA guidance on Low Impact Design>	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide drawings and specs describing EPA best management practices implemented for removal of solids and total phosphorus.		Ensure that pervious parking surfaces are not compacted and are plowed with care to maintain structural integrity and infiltration rates over time. **AND** Inspect stormwater structures to determine if functioning properly. Algae growth and undesirable odors would indicate excess nutrients and thus insufficient water quality treatment.	Conduct periodic post-occupancy evaluation of Stormwater Management and Treatment System.

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Site Credit 7.1: Landscape and Exterior Design to Reduce Heat Islands	Reduce Heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.	Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, including parking lots, walkways, plazas, etc., **OR**, use light-colored/high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces, **OR** place a minimum of 50% of parking space underground **OR** use open-grid pavement system (net impervious area of LESS than 50%) for a minimum of 50% of the parking lot area.	1	**highly recommended**	Shade trees and shade structures, light-colored paving materials, and strategies to reduce use of paving materials on site all contribute to lower ambient temperatures, and reduced urban heat islands effect. If integrated at the beginning of site design, strategies to reduce the urban heat island effect can be developed cost-effectively.		Identify reduction of urban heat island effect as a design goal.	Coordinate EIAP with strategy to reduce the urban heat island effect.			Explore multi-functional and building integrated systems to reduce the urban heat island effect, including shade trees and shade structures, light-colored paving materials, and strategies to reduce use of paving materials. Evaluate potential for meeting the LEED criteria. Provide narrative description of strategies under consideration in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide drawings highlighting all non-roof impervious surfaces and portions of these surfaces and portions that will be shaded within five years, including calculations. demonstrating that a minimum of 30% of non-roof impervious surfaces will be shaded; OR provide specs. and cut sheets for high albedo materials applied to non-roof impervious surfaces highlighting the reflectance of the installed materials, with calculations. that 30% of areas are furnished with these materials; OR provide parking plan demonstrating that a minimum of 50% parking is located underground; OR provide drawings and calculations. highlighting that min. of 50% of parking surfaces are open-grid pavement systems.		Mark tree-save areas prior to construction and put in place sufficient protection.	Maintain dense tree cover to provide maximum shade of impervious surfaces; utilize as buffers; prevent disturbance of vegetation due to mowing and other maintenance activities (such as snow plowing, walking or recreation), conduct maintenance walks to inspect health of tree to maximize life expectance.	
7.2		Use ENERGY STAR Roof compliant, high-reflectance AND low emissivity roofing (initial reflectance of at least .65 and three-year-aged reflectance of at least .5 when tested in accordance with ASTM E408) for a minimum of 75% of the roof surface; OR, install a "green" (vegetated) roof for at least 50% of the roof area.	1	**highly recommended**	Use of "cool roof" technology improves energy efficiency and comfort, and is cost-effective. White colored roofs do not conform to *Force Protection Guidelines* , however a vegetated roof may be an optimal solution for *Force Protection* where groundcover and roof vegetation are similar in appearance. **NOTE:** potential conflict/synergy with *Anti-terrorism Guidelines.*	Coordinate roof options being considered with base architectural standards and force protection guidelines. Consider budgeting for a vegetated roof where this multi-functional solution may be beneficial. Vegetated roofs may contribute to Force Protection goals (less visible from the air, when landscaped to blend with surroundings), while also mitigating stormwater retention requirements on-site and improving energy performance. Additional cost for system is approximately $10/SF for roof areas.	Identify use of "cool roof" solutions as a project goal.	see above			Explore multi-functional and building integrated systems to reduce the urban heat island effect, including light-colored roofing and/or a vegetated roof. Evaluate potential for meeting the LEED criteria. Provide narrative description of strategies under consideration in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide specifications and cut sheets highlighting roofing materials that are energy star labeled, with a minimum initial reflectance of 0.65, a minimum three-year aged reflectance of 0.5, and a minimum emissivity of 0.9. Include area calculations of demonstrating that the roofing material covers a minimum of 75% of total roofing area, **OR** provide specifications and cut sheets highlighting a green vegetated roof system. Include area calculations demonstrating that the green roof covers a minimum of 50% of total roof area.			Inspect roofing membranes for depositions that might interfere with reflectivity and powerwash if necessary; for green roof ensure maintenance contract with landscaping contractor to conduct monthly maintenance walks to ensure proper plant coverage.	
Site Credit 8: Light Pollution Reduction	Eliminate light trespass from the building site, improve night sky access, and reduce development impact on nocturnal environments	Do not exceed Illuminating Engineering Society of North America (IESNA) foot-candle level requirements as stated in the Recommended Practice Manual: Lighting for Exterior Environments, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site.	1	**highly recommended**	The LEED referenced standard for exterior lighting reduces negative effects of light pollution, while also contributing to energy efficiency. This strategy does not add cost, and may result in reduced first cost. **NOTE:** potential conflict with *Anti-terrorism Guidelines.* **SEE ALSO:** AFMAN 32-1082		Review IESNA foot-candle level requirements and site and base exterior lighting requirements to determine if desired security levels can be met using the LEED referenced IESNA guidelines. Unless security requirements are especially restrictive, the IESNA light levels should be sufficient. Document lighting requirements in the program document.	Coordinate strategy for exterior lighting with the EIAP. Depending on nocturnal wildlife inhabiting the site, light control may be a critical issue.	Request that A/E team identify consultant or in-house lighting designer with demonstrated experience in design of high-performance, energy efficient solutions. Lighting designer will be responsible for interior and/or exterior lighting design, and LEED required calculations.		Develop conceptual lighting design. Explore site and base exterior lighting requirements to determine if security levels can be met using the LEED referenced IESNA guidelines. Provide narrative description of exterior lighting solution in the Sustainable Design Report, and make a commitment to meet LEED criteria, if preliminary analysis proves to be promising.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a brief exterior lighting design narrative and exterior lighting design plan demonstrating the lighting objectives and measures that prevent any direct-beam illumination from leaving the building site. **AND** provide an exterior lighting design plan that illustrates the location of all lighting fixtures and features they are to light. **AND** demonstrate that the design will diffuse or muted light will meet IESNA illuminance values measured at eye height, and not create glare or direct lighting onto neighboring property, streets, or the night sky.		Include exterior lighting in commissioning plan. **(See Energy & Atmosphere Prerequisite 1 and Credit 3)**	Ensure light sources are operated within intended parameters and correct light bulbs are being stored for proper replacement	Maintain a log book to verify that light sources continue to operated as intended. Correct light fixtures as needed.

Water Efficiency

5 total

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Water Credit 1.1: Water Efficient Landscaping	Limit or eliminate the use of potable water for landscape irrigation.	Use high efficiency irrigation technology, OR, use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.	1	**highly recommended**	Provides multiple benefits of potable water use reduction, integrated stormwater management and ecological site planning. Water conserving landscape design is highly cost - effective. Benefits of rainwater collection and re-use systems vary regionally, however can be cost-effective as well.		Establish a requirement to use water efficient landscape design to save a minimum of 50% of water consumption over conventional means. Provide written justification if goal is not adopted.	Coordinate EIAP with water-efficient landscaping strategy.	Request that A/E firms demonstrate understanding of relationship between water-efficient landscaping, water collection and re-use systems, reduced water use, stormwater management, ecological site planning and life cycle cost benefits.		Explore potential for rainwater collection system, and develop life cycle cost analysis. **AND** Integrate landscape design with on-site stormwater retention and filtration strategies (e.g. landscaped areas at slightly depressed elevation can function as bioretention areas, collecting stormwater runoff, and reducing irrigation requirements). Discuss strategy for water-efficient landscaping in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the Sustainable Design Report: Provide cut sheets for high efficiency irrigation equipment, including calculations to demonstrate that potable water consumption for irrigation is reduced by 50%. **OR** Provide drawings and a narrative describing the captured rain system or recycled site water system with the capacity of the system highlighted, including calculations to demonstrate that potable water consumption for irrigation is reduced by 50%.	Describe rainwater collection and re-use systems in the pre-bid conference, if applicable.	Include irrigation system and water collection and re-use system in the commissioning plan. **(See Energy & Atmosphere Prerequisite 1 and Credit 3)**	If irrigation is necessary, irrigate in the early morning or late afternoon hours to avoid loss of water to evapo-transpiration. Periodically review the operations of the site to identify resources for recycled water.	Quantify water consumed for irrigation. Regularly (daily, weekly, monthly, annually) record water meter readings to verify water savings compared to other landscaped areas. Communicate water consumption to facility manager.
1.2:		Use only captured rain or recycled site water for an additional 50% reduction (100% total reduction) of potable water for site irrigation needs, OR, do not install permanent landscape irrigation systems.	1	**recommended**	Combines potable water use reduction with effective and efficient stormwater management as part of ecological site planning.		Evaluate climate and landscaping requirements to determine if LEED requirement can be met. If so, identify use of water efficient landscaping and/or water recycling to achieve a 100% reduction in potable water use for irrigation as a project goal.	Coordinate EIAP with water-efficient landscaping strategy. **AND** Review ordinances, and apply for water reuse permits and/or variances if applicable.	see above		Explore potential for rainwater collection system to cover 100% of landscape irrigation requirements, and develop life cycle cost analysis. **OR** Select native plantings that do not require irrigation. Discuss strategy for water-efficient landscaping in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide drawings and a narrative describing the captured rain system or recycled site water system with the capacity of the system highlighted, including calculations to demonstrate that potable water consumption for irrigation is reduced by 100%. **OR** Provide a design narrative of the landscape design and describe why a permanent landscape irrigation system is not required.	Describe rainwater collection and re-use systems in the pre-bid conference, if applicable.	see above	see above	see above
Water Credit 2: Innovative Wastewater Technologies	Reduce generation of wastewater and potable water demand, while increasing local aquifer recharge.	Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR, treat 100% of wastewater on site to tertiary standards.	1	**conditionally recommended**	Facilities that use large quantities of water can realize sizable economic and environmental benefit from greywater reuse systems. In areas with no municipal sewage system, constructed wetland wastewater treatment systems can generate both economic and environmental benefits. Water treatment and reuse systems reduce sewer/septic infrastructure and reuse treated effluent for non-potable uses (e.g. exterior landscape irrigation, toilet flushing, cooling tower makeup) to further reduce potable water use.	Evaluate local infrastructure. If no municipal sewage treatment system exists, or if existing system is at capacity, budget funds to study biological on-site wastewater treatment as a cost-effective and environmentally preferable alternative to septic or expanded sewage treatment during the design phase.		Review ordinances, and apply for permits and/or variances for water reuse and/or alternative wastewater treatment if applicable.	Request that A/E firms demonstrate understanding of alternative wastewater treatment, or identify a specialty consultant. **AND** Request that A/E firms identify plumbing engineer with experience in dual plumbing systems.	Document requirement in the SOW for feasibility study(s) and engineering report(s), to explore potential use of innovative wastewater treatment strategies, and to select the preferred system option.	Complete feasibility study(s) for innovative wastewater treatment and reuse systems prior to the design charrette. If commitment is made to pursue use of the technology further, include location of tanks and/or wetlands on the conceptual site plan.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a narrative of measures implemented to reduce potable water/sewage conveyance. Include calculations demonstrating that potable water/sewage conveyance volumes are reduced by 50% over baseline conditions.	Select contractor with demonstrated experience in installation of water treatment and reuse systems, rainwater collection systems and dual plumbing systems.	Include water treatment and reuse systems and constructed wetlands in the commissioning process. **AND** For constructed wetlands: verify that plantings selected are suitable, and the planting is scheduled appropriately.	Inspect tanks, pipes and fittings regularly. **AND** For constructed wetland systems, inspect plant health and survival in first year of operation, replant and/or weed as required. **AND** Provide periodic monitoring of water quality as required by permits.	Include water treatment and reuse systems and constructed wetlands in the M&V process.
Water Credit 3.1: Water Use Reduction	Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.	Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.	1	**recommended**	Water efficient plumbing fixtures, appliances, and HVAC equipment reduce potable water use, water/wastewater fees, energy consumption for water treatment and pumping, as well as chemicals that would have been used as the conventional treatment alternative. This 20% improvement target can generally be met with conventional technology. **SEE ALSO:** A-Gram 01-03	If water use in the facility is high (e.g. multi-family residential, gym, laundry facility, etc.), consider budgeting funds to study the feasibility of an on-site greywater treatment and reuse system.	During the programming, identify use of water efficient fixtures as a project goal. **AND** Calculate rainwater and greywater availability versus non-potable water requirements in the facility, to determine if rainwater and/or greywater reuse is potentially viable. If preliminary analysis is positive, plan for a more detailed feasibility analysis during the concept design phase.		Request that A/E firms identify plumbing engineer with experience with specification of water efficient fixtures and dual plumbing systems.		Complete feasibility study for use of efficient fixtures and determine if LEED goal can be met. Document findings in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide cut sheets for all water consuming fixtures necessary for the occupancy use of the building, with water conservation specifications highlighted. Demonstrate that plumbing fixtures meet or exceed fixture performance requirements of the Energy Policy Act of 1992. AND provide a water budget calculation demonstrating that occupancy based potable water consumption is reduced by 20% over baseline conditions. <see Water Conservation handbook MIL-HBDK-1165>		Ensure proper operation of fixtures and flow meter. Repair/replace as needed.	Quantify water consumed in buildings. Regularly (daily, weekly, monthly, annually) record water meter readings to verify water savings compared to other facilities of equal size and use. Communicate water consumption to building occupants.

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3.2:		Exceed the potable water use reduction by an additional 10% (30% total efficiency increase).	1	**conditionally recommended**	Water efficient plumbing fixtures, appliances, and HVAC equipment reduce potable water use, water/wastewater fees, energy consumption for water treatment and pumping, as well as chemicals that would have been used as the conventional treatment alternative. Use of rainwater collection and/or water re-use systems also contributes to water use reduction **(see Water Credit 2)** This 30% reduction target generally requires use of some unconventional technology (e.g. waterless urinals, composting toilets, greywater recycling), however project specific analysis must be completed to determine which strategies should be used to fulfill this credit.		see above	Review ordinances, and apply for water reuse permits and/or variances if applicable.				Complete feasibility study for use of efficient fixtures and determine if LEED goal can be met. Document findings in the Sustainable Design Report.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide cut sheets for all water consuming fixtures necessary for the occupancy use of the building, with water conservation specifications highlighted. Demonstrate that plumbing fixtures meet or exceed fixture performance requirements of the Energy Policy Act of 1992. AND provide a water budget calculation demonstrating that occupancy based potable water consumption is reduced by 30% over baseline conditions.	see above	Ensure dual plumbing system is installed in accordance with current health standards and new plumbing regulations that govern non-potable water use.	see above	Quantify water consumed in buildings. Regularly (daily, weekly, monthly, annually) record water meter readings to verify water savings compared to other facilities of equal size and use.

Energy and Atmosphere

Energy and Atmosphere Prerequisite 1: Fundamental Building Systems Commissioning	Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.	Implement all of the following fundamental best practice commissioning procedures:	LEED req	**highly recommended**	Commissioning is highly recommended for all projects. Investment in commissioning can be justified by lower maintenance costs over the first few years, as problems are discovered and addressed pro-actively prior to occupancy, and lower energy costs (studies show that energy costs are reduced by an average of 20% because equipment operates as designed.) Refer to the WBDG for a detailed discussion of commissioning. **SEE ALSO:** ETL 90-10	Fundamental Building Systems Commissioning should be adopted as a minimum. Scope should be determined at the planning phase, and cost for fundamental commissioning should be included in basic services.		Request that A/E firms identify commissioning agent on team.	Include commissioning requirements in SOW.				Describe commissioning requirements in the pre-bid conference.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a copy of the commissioning plan highlighting the six fundamental commissioning procedures as listed in the credit requirements. **AND** Provide a signed letter of certification by the commissioning authority confirming that the commissioning plan has been successfully executed and the design intent of the building has been achieved.		
		- Engage a commissioning authority.							- Engage a commissioning authority.							
		- Develop design intent and basis of design documentation.									- Develop design intent and basis of design documentation.					
		- Include commissioning requirements in the construction documents.										- Include commissioning requirements in the construction documents.				
		- Develop and utilize a commissioning plan.												- Develop and utilize a commissioning plan.		
		- Verify installation, functional performance, training and documentation.												- Verify installation, functional performance, training and documentation.		
		- Complete a commissioning report.												- Complete a commissioning report.		

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Energy and Atmosphere Prerequisite 2: Minimum Energy Performance	Establish the minimum level of energy efficiency for the base building and systems.	Design to meet building energy efficiency and performance as required by ASHRAE/IESNA 90.1-1999 or the local energy code, whichever is the more stringent. (note: The requirements of 10 CFR 434 are equivalent to ASHRAE/IESNA 90.1-1999)	required	**required**	The 1999 version of ASHRAE/IESNA 90.1 supercedes the earlier version, ASHRAE/IESNA 90.1-1989. While it has not yet been adopted by many jurisdictions, it represents current best-practice standards that should form the minimum level of energy efficiency. Use of this improved minimum standard will reduce use of fossil fuels, and produce life cycle cost savings. **SEE ALSO:** ETL 94-4		During programming, identify ASHRAE/IESNA 90.1-1999 or the local energy code, whichever is the more stringent, as the required minimum standard for energy performance. Provide written justification if a less stringent minimum standard is adopted.	Contact authority having jurisdiction for code compliance to verify that compliance with the designated minimum standard (per LEED requirement) will meet local requirements. If designated minimum standard is not accepted, additional energy compliance calculations may need to be done to demonstrate compliance with LEED referenced standard.		Document minimum required standard for energy performance and documentation requirements in the SOW. **AND** Provide written justification if planning phase recommendation is not followed.		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** State whether the energy design process followed ASHRAE/IESNA 90.1-1999 or local energy codes. If local energy codes were applied, demonstrate that the local code is equivalent to or more stringent than ASHRAE/IESNA 90.1-1999. **AND** Provide a summary table of design features that minimally comply with applicable mandatory and prescriptive requirements in ASHRAE/IESNA 90.1-1999, section 5-10 or local energy code (whichever is stricter) OR a copy of the Energy Cost Budget Compliance Report.				
Energy and Atmosphere Prerequisite 3: CFC Reduction in HVAC&R Equipments	Reduce ozone depletion.	Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phaseout conversion.	LEED req	**highly recommended**	Manufacture of CFC's and Halons has been completely phased-out as required by section 604 of the Clean Air Act. In new buildings it is standard practice to use non-CFC equipment. In existing buildings CFC-based equipment may continue to be used however refrigerants must be purchased from reclaimed sources, and sources are limited. Existing equipment that uses CFC-based refrigerants should be replaced at the time of building renovation to avoid need for future replacement, to reduce environmental impacts, and for added benefit of greater energy efficiency. **SEE ALSO:** ETL:91-7	If renovating or re-using an existing facility, evaluate existing HVAC&R equipment to determine if CFC-based refrigerants are used. If equipment uses CFC-based refrigerants, plan for a comprehensive CFC phaseout conversion that will capture CFC's and either convert or replace equipment. Budget for CFC phaseout conversion in 1391.	Document CFC phaseout requirements in the program document, where appropriate.			Include requirements for CFC phaseout in SOW.		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** For existing buildings, provide a listing of all existing HVAC&R components and state whether each component uses CFC's. For those components that use CFC's provide a copy of the phase out plan describing how these components will be converted or removed and replaced with CFC-free components before construction is complete.	Highlight requirements for CFC phaseout conversion in pre-bid conference.	Include review of CFC phaseout conversion in commissioning plan.		
Energy and Atmosphere Prerequisite 3 (AF Amendment): Atmospheric Air Quality Protection	**AF Amendment:** Minimize adverse impacts to atmospheric air quality	**AF Amendment:** Comply with the regulatory guidance governing atmospheric air quality, including the federal Clean Air Act, and related state and local laws.	required	**required**	This is a regulatory requirement. Compliance is mandatory.		Identify compliance with the federal Clean Air Act as a project requirement during the programming phase, and develop a list of applicable state and local air quality laws that also must be met.				For facilities with high emissions: integrate chemical and mechanical air pollution control equipment into design to control emission of air pollutants and odors at the source.	Document compliance with the federal Clean Air Act and applicable state and local air quality laws in the **Sustainable Design Report.**		Discontinue construction activities that generate particulate or dispersible pollutants during adverse weather conditions (e.g. postpone sandblasting during periods of high wind).	Use dust suppression methods to control fugitive dust (e.g. regular dry sweeping, wetting of stockpiles, and use of enclosures for belt delivery systems).	
Energy and Atmosphere Credit 1: Optimize Energy Performance	Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.	Reduce design energy cost compared to the energy cost budget for regulated energy components described in the requirements of ASHRAE/IESNA Standard 90.1-1999, as demonstrated by a whole building simulation using the energy Cost Budget Method described in Section 11. Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems defined by ASHRAE. (note: The requirements of 10 CFR 434 are equivalent to ASHRAE/IESNA 90.1-1999)			Energy conservation reduces reliance on fossil fuels, reduces associated pollution, and reduces utility costs. Federal projects are required by the Energy Policy Act of 1992, to incorporate energy saving design strategies that can be cost justified with a payback period of 10 years or less.	Budget for energy analysis in 1391. Cost varies depending on size and complexity of project, however in general energy analysis adds $0.15 to $0.30 per SF to the design fee.	During the programming phase, identify energy conservation as a project goal.		Request that A/E demonstrate experience in the design of energy efficient buildings.	Define energy modeling requirements in the SOW. Include creation of base case energy model, characterization of energy use by cost and by consumption, development of energy conserving measures (ECM's) with impact on energy use and peak load for each, energy analysis of at least 3 preferred schemes that bundle ECM's, and up to 3 revised energy runs to track energy performance as the design in refined and finalized.	Prior to the charrette, develop base case energy model that meets the USAF Energy Use Budget (EUB) and the minimally required energy standard. **AND** Develop energy cost and energy use characterization, review design criteria and explore potential for passive solar load reduction, prior to exploring HVAC system alternatives. See the USAF Passive Solar Handbook and the WBDG for information on passive strategies **AND** Provide a narrative description of the proposed energy conservation strategies in the **Sustainable Design Report**.	Optimize the performance of the facility, in terms of energy performance, daylighting, and life cycle value. Determine energy savings based on comparison of final design and base case design. Document energy efficiency strategies in the **Sustainable Design Report.**		Engage in commissioning to ensure proper functioning of all energy conserving technologies. **(See Energy & Atmosphere: Prerequisite 1 and Credit 3)**	Follow operations and maintenance plan developed during the commissioning phase to ensure proper functioning of all energy conserving technologies. **(See Energy & Atmosphere: Credit 3)** Educate occupants on energy conservation measures.	Develop measurement and verification plan to ensure proper functioning of all energy conserving technologies. **(See Energy & Atmosphere: Credit 5)**

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1.1:		New Bldgs. 20% OR Existing Bldgs. 10%	2	**highly recommended**	A 20% improvement for new buildings and a 10% improvement for existing buildings is a good minimum target for energy efficiency. Improvement is measured based on reduced energy cost, compared to the LEED minimally required energy standard (See Energy Prerequisite 2).							Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a narrative highlighting energy saving measures incorporated in the building design, including an isometric of the building showing the basic floor plate shape and external projections. Include a table listing baseline and proposed comparisons of all model variables that are different. **AND** Demonstrate that the design energy cost is 20% lower for new buildings or 10% lower for existing buildings than the energy cost as defined in ASHRAE/IESNA 90.1-1999, Section 11. Provide a completed and signed copy of the Energy Cost Budget (ECB) Compliance Form.				
1.2:		New Bldgs. 30% OR Existing Bldgs. 20%	4	**recommended**	A 30% improvement for new buildings and a 20% improvement for existing buildings is generally achievable using cost-effective, off-the-shelf technologies that are well integrated with passive solar design strategies. Improvement is measured based on reduced energy cost, compared to the LEED minimally required energy standard (See Energy Prerequisite 2).							Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a narrative highlighting energy saving measures incorporated in the building design, including an isometric of the building showing the basic floor plate shape and external projections. Include a table listing baseline and proposed comparisons of all model variables that are different. **AND** Demonstrate that the design energy cost is 30% lower for new buildings or 20% lower for existing buildings than the energy cost as defined in ASHRAE/IESNA 90.1-1999, Section 11. Provide a completed and signed copy of the Energy Cost Budget (ECB) Compliance Form.				
1.3:		New Bldgs. 40% OR Existing Bldgs. 30%	6	**recommended**	A 40% improvement for new buildings and a 30% improvement for existing buildings is generally achievable using cost-effective, off-the-shelf technologies that are well integrated with passive solar design strategies. Improvement is measured based on reduced energy cost, compared to the LEED minimally required energy standard (See Energy Prerequisite 2).							Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a narrative highlighting energy saving measures incorporated in the building design, including an isometric of the building showing the basic floor plate shape and external projections. Include a table listing baseline and proposed comparisons of all model variables that are different. **AND** Demonstrate that the design energy cost is 40% lower for new buildings or 30% lower for existing buildings than the energy cost as defined in ASHRAE/IESNA 90.1-1999, Section 11. Provide a completed and signed copy of the Energy Cost Budget (ECB) Compliance Form.				

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1.4:		New Bldgs. 50% OR Existing Bldgs. 40%	8	**conditionally recommended**	Depending on the building type, and the climate zone, a 50% improvement for new buildings and a 40% improvement for existing buildings may or may not be achievable using conventional technology. Improvement is measured based on reduced energy cost, compared to the LEED minimally required energy standard (See Energy Prerequisite 2).							Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a narrative highlighting energy saving measures incorporated in the building design, including an isometric of the building showing the basic floor plate shape and external projections. Include a table listing baseline and proposed comparisons of all model variables that are different. **AND** Demonstrate that the design energy cost is 50% lower for new buildings or 40% lower for existing buildings than the energy cost as defined in ASHRAE/IESNA 90.1-1999, Section 11. Provide a completed and signed copy of the Energy Cost Budget (ECB) Compliance Form.				
1.5:		New Bldgs. 60% OR Existing Bldgs. 50%	10	**conditionally recommended**	Depending on the building type, and the climate zone, a 60% improvement for new buildings and a 50% improvement for existing buildings may or may not be achievable using conventional technology. Improvement is measured based on reduced energy cost, compared to the LEED minimally required energy standard (See Energy Prerequisite 2).							Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a narrative highlighting energy saving measures incorporated in the building design, including an isometric of the building showing the basic floor plate shape and external projections. Include a table listing baseline and proposed comparisons of all model variables that are different. **AND** Demonstrate that the design energy cost is 60% lower for new buildings or 50% lower for existing buildings than the energy cost as defined in ASHRAE/IESNA 90.1-1999, Section 11. Provide a completed and signed copy of the Energy Cost Budget (ECB) Compliance Form.				
Energy and Atmosphere Credit 2: Renewable Energy	Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.	Supply a net fraction of the building's total energy use (as expressed as a fraction of annual energy cost through the use of on-site renewable energy systems:		**conditionally recommended**	Renewable energy sources include solar, wind, and biomass generation technologies. These technologies provide clean, renewable sources of energy, and increase energy independence in the US. When renewable energy strategies are integrated on-site, electricity transmission losses are eliminated. Some sites will be more compatible with renewable strategies than others. In some parts of the country, renewable energy systems are beginning to be a cost-effective option. These include areas where electricity rates are high (or, high demand charges exist), and access to sun, wind, or biomass is good. In some parts of the country, programs exist to reduce the first cost of renewable energy systems. **SEE ALSO:** 10USC 2857; AFI 32-1023, C5.4	Study potential for cost-effective use of renewable energy systems, using the FRESA (Federal Renewable Energy Screening Assistant) software or FEMP (Federal Energy Management Program) design assistance. Identify applicable federal, state, or utility-based incentive programs that will buy down the cost of renewable systems. Where analysis indicates that use of renewable technology will produce a simple payback of less than 10 years, plan for additional design effort for further evaluation. Budget for renewable energy systems in 1391 where appropriate.		Coordinate EIAP with renewable energy strategy (reduced emissions).	Where preliminary screening indicates that use of renewable energy systems may be cost-effective, request that A/E team demonstrate experience in design of renewable energy systems.	Where preliminary screening indicates that use of renewable energy systems may be cost-effective, include requirement for integration of renewable energy systems into the design. Require that the type of systems and size of systems be optimized using life cycle cost analysis.	Document approach for integrating renewable energy systems into the design in the Sustainable Design Report. Describe the system type(s), size of each system, and power output of each system.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide drawings, cut sheets, & specifications highlighting on-site renewable energy systems installed in the building.		Engage in commissioning to ensure proper functioning of all renewable energy technologies. **(See Energy & Atmosphere: Prerequisite 1 and Credit 3)**	Follow operations and maintenance plan developed during the commissioning phase to ensure proper functioning of all renewable energy technologies. **(See Energy & Atmosphere: Credit 3)**	Develop measurement and verification plan to ensure proper functioning of all renewable energy technologies. **(See Energy & Atmosphere: Credit 5)**
2.1		5% of total energy cost in renewables	1						Process Mapping			**AND** Provide calculations showing that 5% of total energy costs are supplied by on-site renewable systems.				

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2.2		10% of total energy cost in renewables	2									**AND** Provide calculations showing that 10% of total energy costs are supplied by on-site renewable systems.				
2.3		20% of total energy cost in renewables	3									**AND** Provide calculations showing that 15% of total energy costs are supplied by on-site renewable systems.				
Energy and Atmosphere Credit 3: Additional Commissioning	Verify and ensure that entire building is designed, constructed, and calibrated to operate as intended.	In addition to the Fundamental Building Commissioning prerequisite, implement the following additional commissioning tasks:	1	**highly recommended**	Full systems commissioning is highly recommended for all projects. Investment in commissioning can be justified by lower maintenance costs over the first few years, as problems are discovered and addressed pro-actively prior to occupancy. Studies show that energy costs are also reduced in buildings with full systems commissioning because equipment operates as designed. Refer to the WBDG for a detailed discussion of commissioning.	Commissioning scope should be defined to meet the LEED requirement for additional commissioning during the planning phase because it has significant budget impact. The additional fee required for commissioning should be included in 1391 budget request. Per the WBDG, full systems commissioning will cost between $0.50 to $1.50 per SF; costs tend to be higher for buildings with complex systems, and lower for smaller buildings with less complex systems.			Request that A/E teams include a third-party commissioning agent, that is not a member of the design team.	Document commissioning requirements in the SOW. Coordinate with Fundamental Building Systems Commissioning (Energy Prerequisite 1) and Measurement and Verification (Energy Credit 5).	Develop Basis of Design report to document design criteria established for the project.		Highlight commissioning requirements in the pre-bid conference.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide an excerpt from the Commissioning Plan highlighting the five additional commissioning tasks as listed in the credit requirements. **AND** Provide a signed letter of certification by an independent Commissioning Authority confirming that Tasks 1, 2, and 3 of the credit requirements have been successfully executed. Evidence of the design review must be submitted in a written report. **AND** Provide a signed letter of certification by an independent Commissioning Authority or designer confirming that Tasks 4 and 5 of the credit requirements have been successfully executed.	Define a schedule for a post-occupancy review and for periodic recommissioning, and ensure that these tasks are successfully completed.	Coordinate commissioning plan with ongoing measurement and verification strategy. **(See Energy and Atmosphere Credit 5)**
		- Conduct a focused review of the design prior to the construction documents phase. - Conduct a focused review of the construction documents when close to completion - Conductive a selective review of contractor submittals of commissioned equipment. - Develop a system and energy management manual - Have a contractor in place for a near-warranty or post occupancy review. - Items 1, 2, and 3 must be performed by someone other than the designer.										- Conduct a focused review of the design prior to the construction documents phase. - Conduct a focused review of the construction documents when close to completion		- Conductive a selective review of contractor submittals of commissioned equipment. - Develop a system and energy management manual - Have a contractor in place for a near-warranty or post occupancy review.		
Energy and Atmosphere Credit 4: Elimination of HCFC's and Halons	Reduce ozone depletion and support early compliance with the Montreal Protocol.	Install base building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFC's or Halon.	1	**conditionally recommended**	A balance must be struck between the goals of reducing ozone depletion, and reducing impacts on global warming. Some solutions, such as ground source heat pumps, or passive technologies that eliminate the need to use refrigerants can contribute to both goals. HCFC-based refrigerants are the only choice of refrigerant-based equipment for smaller buildings. Some of the non-HCFC-based refrigerants are less efficient than their HCFC-based Halons are no longer a legally permissible option for fire suppression systems. Existing systems will need to be replaced.		Identify elimination of HCFC's and Halons as a project goal. However, HCFC elimination should not compromise energy efficiency goals.				As system options are explored, include consideration of HCFC-free options. Provide justification for proposed HVAC system, and type of refrigerant used in the **Sustainable Design Report**.	As system selection is finalized, include consideration of HCFC-free options. Provide justification for selected HVAC system, and type of refrigerant used in the **Sustainable Design Report.**		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a letter from the architect or engineer stating that HVAC&R systems are free of HCFC's and Halons. Include equipment schedules and cut sheets highlighting refrigerant information for all HVAC&R system components.		

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Energy and Atmosphere Credit 5: Measurement and Verification	Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.	Comply with the installed equipment requirements for continuous metering as stated in Option B: Methods by Technology of the US DOE's International Performance Measurement and Verification Protocol (IPMVP) for the following: - Lighting systems and controls. - Constant and variable motor loads. - Variable frequency drive (VFD) operation. - Chiller efficiency at variable loads (kW/ton). - Cooling load. - Air and water economizer and heat recovery cycles. - Air distribution static pressures and ventilation air volumes. - Boiler efficiencies. - Building specific process energy efficiency systems and equipment. - Indoor water risers and outdoor irrigation systems.	1	**highly recommended**	The LEED referenced Measurement and Verification (M&V) standard was developed primarily for verifying performance contracts related to building retrofits, however the protocol also is relevant to new buildings as a method to ensure that predicted energy and water savings are actually producing savings to the owner. Adoption of this standard provides an effective quality control method for managing energy and water efficiency throughout the life of the building.	It is highly recommended that all building projects over 50,000 SF in size develop a Measurement and Verification (M&V) plan. M&V is not included in basic services. Budget for M&V in 1391.	Identify Measurement and Verification (M&V) requirements in the program document, as appropriate.		Request that A/E identify team members with expertise in development of a M&V Plan.	Document M&V requirements in the SOW. At a minimum, the M&V plan should include the following: - Lighting systems and controls. - Constant and variable motor loads. - Variable frequency drive (VFD) operation. - Chiller efficiency at variable loads (kW/ton). - Cooling load. - Air and water economizer and heat recovery cycles. - Air distribution static pressures and ventilation air volumes. - Boiler efficiencies. - Building specific process energy efficiency systems and equipment. - Indoor water risers and outdoor irrigation systems.		Verify that Building Automation System (B.A.S.) is designed to facilitate collection of data for on-going monitoring of building performance. Describe design approach to M&V in the **Sustainable Design Report**.		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a copy of the Measurement & Verification Plan. **AND** Include a summary schedule of the instrumentation and controls for the ten required monitoring categories, highlighting the I/O data points to be collected. **AND** Include cut sheets of sensors and the data collection system used to provide continuous metering per IPMVP standards.	Include review of continuous metering data in O&M routine.	
Energy and Atmosphere Credit 6: Green Power	Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.	Engage in a two year contract to purchase power generated from renewable sources that meet the Center for Resource Solutions (CRS) Green-E requirements.	1	**conditionally recommended**	Green electricity has been defined by the Center for Resource Solutions (CRS) Green-e products certification process. Commitment to use green electricity helps to build the market for renewable power generation. Current costs for green power are slightly greater than conventional power, however over time these sources may prove to have more stable pricing than conventional sources. Green power is not currently available in all localities.		Explore potential for use of green power as defined by the LEED criteria. Green power is not currently available in all localities. To see if green power is an option for your project, visit www.green-e.org to see a listing of certified green power providers in every state. If available, consider identifying use of green power as a project goal.					If the project is in an open market state, investigate power marketers that are licensed to provide power in that state. Consider using power from a provider that provides electric from non-polluting renewable energy and meets the Green-e requirements.		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a copy of the two-year electric utility purchase contract for power generated from renewable sources. **AND** Provide documentation demonstrating that the supplied renewable power meets the referenced Green-e requirements.		Review status of electricity provider to ensure that Green-e certification remains intact. If supplier loses certification, explore opportunities to switch to another green-e certified supplier.

Materials and Resources

LEED Credit	Intent	Requirement	LEED Points	AF Policy	Justification	Planning	Programming	Approvals	A/E Selection	Contract	Concept Design	Design Development / Documentation	Bidding and Award	Construction and Commissioning	Operations and Maintenance	Measurement and Verification
Materials and Resources Prerequisite 1: Storage and Collection of Recyclables	Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.	Provide an easily accessible area that serves the entire building that is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals.	LEED req	**highly recommended**	Reduces waste to landfills, and supports the market for recycled materials. Recycling is legally required in many jurisdictions, and revenue from recycling is increasing. Even if recycling is not available in the locality, design to accommodate recycling will enable building to respond to future opportunities.		During requirements analysis, allocate space for collection of recyclables at the point of use (copy rooms, break areas, etc.), and recycling storage and staging areas at the loading dock. Design should accommodate present opportunities for recycling, and the LEED required materials for recycling at a minimum.			Document recycling requirements in the SOW		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide drawings highlighting locations for collection and storage of materials separated for recycling. Indicate the path from recycling locations to the building loading dock and demonstrate that the recycling area can handle the recycling material volumes generated by building occupants.		Include special recycling equipment such as chutes, automated sorters, and compactors in the commissioning process.	Schedule periodic review of recycling strategy to determine if recycling goals are being met, and to identify additional recycling opportunities. Ensure that the recycling area is kept clean and attractive. Provide ongoing outreach to staff to inform them of successful recycling.	Track quantity of waste material generated annually, as well as quantity and type of materials diverted from the waste stream. Calculate tipping fees avoided and revenue gained from recycling annually.
Materials and Resources Prerequisite 2 (AF Amendment): Hazardous Materials and Waste Management	**AF Amendment:** Ensure proper handling of hazardous waste materials.	**AF Amendment:** Comply with the requirements of the federal Toxic Substances Control Act (TSCA), Resource Conservation and Recovery Act (RCRA), and the Occupational Safety and Health Act (OSHA) guidelines.	required	**required**	This is a regulatory requirement. Compliance is mandatory.	Budget for proper removal of hazardous materials such as asbestos, lead, and other hazardous constituents listed in TSCA, RCRA, and OSHA.	During the programming phase identify compliance with TSCA and RCRA as a requirement	Coordinate strategies for hazardous materials handling with EIAP.		Identify compliance with TSCA and RCRA as a requirement in the SOW.		Eliminate use of toxic or hazardous materials to the greatest extent practicable. Identify demolition debris and materials specified for use that have special disposal requirements based on TSCA , RCRA, or OSHA in the **Sustainable Design Report.**		Ensure proper handling of any hazardous waste materials generated during construction and demolition, including asbestos, lead, and other hazardous constituents, as required under TSCA, RCRA, and OSHA. Document compliance with regulations in the **Sustainable Design Report.**	Select maintenance materials with the least hazardous waste stream to avoid the need for hazardous waste disposal.	Audit waste stream to determine quantity of hazardous waste materials that are being disposed of. AND Explore opportunities to modify materials procurement and materials use to reduce the quantity of hazardous waste generated.
Materials and Resources Credit 1: Building Reuse	Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste, and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.	Reuse large portions of existing structures during renovation or redevelopment projects.				During site selection, consider sites with potential for renovation and reuse of existing facilities. **AND** When comparing cost of building new vs. renovating, include cost to demolish existing facility in the "new construction" cost estimate.	If site selected has an existing building, evaluate potential for re-use. Evaluate the building's structural integrity and skin, functional suitability, code-compliance, historic and cultural significance, and adaptability. Provide written justification for if decision is made to demolish an existing building.	Coordinate EIAP with reuse / renovation of existing structure.	Where project involves potential reuse of an existing structure, request that A/E firm demonstrate experience with reuse / renovation of existing structures.	Document reuse / renovation requirements in the SOW.	Considering need to upgrade existing building components to improve energy and water efficiency. Evaluate HVAC systems, plumbing fixtures, envelope performance including (insulation, infiltration control, and windows). Identify asbestos, lead-based paint, and other contaminants in the building that require special procedures to remove or isolate. Document review of existing building reuse issues in the **Sustainable Design Report**.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:**	Clearly describe extent of building to remain, in the pre-bid conference.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:**		
1.1		Maintain at least 75% of existing building structure and shell (exterior skin and framing excluding window assemblies).	1	**conditionally recommended**	Conserves resources, and reduces waste materials going to landfills. Also reduces development pressures on greenfield sites. However, this credit can only be earned by projects utilizing sites with an existing building that can be reused.	see above		see above	see above	see above	see above	Provide pre-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 75% of the structure and shell was reused.	see above	Provide post-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 75% of the structure and shell was reused.		
1.2		Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing excluding window assemblies).	1	**conditionally recommended**	see above	see above		see above	see above	see above	see above	Provide pre-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 100% of the structure and shell was reused.	see above	Provide post-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 100% of the structure and shell was reused.		

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1.3		Maintain 100% of existing building structure and shell AND 50% non-shell (walls, floor coverings, and ceiling systems).	1	**conditionally recommended**	see above	see above		see above	see above	see above	see above	Provide pre-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 100% of the structure and shell was reused. **AND** Provide pre-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 50% of the non-shell components were reused.	see above	Provide post-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 100% of the structure and shell was reused. **AND** Provide post-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 50% of the non-shell components were reused.		
Materials and Resources Credit 2: Construction Waste Management	Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable material back to the manufacturing process.	Develop and implement a waste management plan, quantifying material diversion by weight. (Remember that salvage may include the donation of materials to charitable organizations such as Habitat for Humanity.)					During the programming phase, identify recycling of construction and demolition waste as a project goal.				Research local recycling infrastructure to determine which materials can be effectively recycled. Consider opportunities to reuse land clearing and demolition materials on-site to the greatest extent possible. Set a goal for the percentage of construction, demolition and land clearing debris that can be recycled, and describe strategy to accomplish goal in the **Sustainable Design Report**.	Refer to Waste Spec for guidance on developing a Construction Waste Management specification (http://www.tjcog.dst.nc.us/cdwaste.htm)	Clearly describe requirements for construction waste management in the pre-bid conference, including requirement that waste management plan must track amounts of waste recycled and landfilled, with all weight tickets submitted for validation.			
2.1		Recycle and/or salvage at least 50% (by weight) of construction, demolition, and land clearing waste.	1	**highly recommended**	Recycling of demolition and construction waste diverts waste from landfills. The available infrastructure to support recycling will vary regionally, however concrete, metals, asphalt, cardboard and plastics are cost-effective to recycle in most parts of the country.		see above				see above	see above	see above	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a copy of the Waste Management Plan for the project highlighting recycling and salvage requirements. **AND** Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.		
2.2		Recycle and/or salvage an additional 25% (75% total by weight) of construction, demolition, and land clearing waste.	1	**recommended**	see above		see above				see above	see above	see above	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a copy of the Waste Management Plan for the project highlighting recycling and salvage requirements. **AND** Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.		

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Materials and Resources Credit 3.1: Resource Reuse	Extend the life cycle of targeted building materials, reducing environmental impacts related to materials manufacturing and transport.	Specify salvaged or refurbished materials for 5% of building materials.	1	**conditionally recommended**	Re-use of salvaged or refurbished materials is environmentally beneficial and generally reduces construction cost, however availability is limited and sometimes difficult to coordinate with construction of larger projects. Re-use of existing furniture must be considered carefully, as use of older furniture or non-standardized furniture can negatively impacts space planning efficiencies.	Determine whether facility will re-use furniture from other facilities, purchase re-furbished furniture, or purchase new furniture. Document budget impact of decision regarding furniture on 1391.	Document decisions regarding use of new or used furniture in the programming phase. **AND** Identify selective use of salvaged / refurbished materials that do not compromise performance as a project goal.				Develop a strategy for considering the use of salvaged or refurbished materials, such as wood flooring, doors and frames, cabinetry, furniture, brick and other masonry. Consider use of government surplus materials. Describe strategy in the **Sustainable Design Report**.	Finalize specifications for the use of salvaged or refurbished materials. Consider allowing contractor option of substituting salvaged or refurbished materials if quality meets specification requirements. Develop a goal for the use of salvaged materials using the LEED calculation method. Describe strategy in the **Sustainable Design Report**.	Clearly describe use of salvaged or refurbished materials in the pre-bid conference.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide specifications and contractor submittals highlighting salvaged and refurbished materials used on project. **AND** Provide calculations demonstrating that 5% of building materials were salvaged. Include the origin and cost for salvaged materials and the total cost for building materials.		Review performance of salvaged or refurbished materials to verify that performance is equal or superior to conventional materials and products.
3.2		Specify salvaged or refurbished materials for 10% of building materials.	1	**conditionally recommended**	see above	See above	See above				see above	see above	see above	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide specifications and contractor submittals highlighting salvaged and refurbished materials used on project. **AND** Provide calculations demonstrating that 10% of building materials were salvaged. Include the origin and cost for salvaged materials and the total cost for building materials.		see above
Materials and Resources Credit 4.1: Recycled Content	Increase demand for building products that have incorporated recycled content material, reducing the impacts resulting from extraction of new material.	Specify a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post-consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material.	1	**strongly recommended**	Use of recycled content materials helps support the market for recycled content materials. Many high quality recycled content products are readily available for use. Some of these are new products, however many are standard products in the industry. Federal projects are required to meet the EPA Comprehensive Procurement Guidelines (CPG). **SEE ALSO:** AFI 32-7080; ETL 00-1		Identify use of recycled content materials as a project goal.		Request that A/E demonstrate knowledge of the EPA Comprehensive Procurement Guidelines (CPG) for the use of materials with recovered content. (See http://www.epa.gov/cpg/)	Document requirement to meet EPA Comprehensive Procurement Guidelines (CPG) for the use of materials with recovered content in the SOW.	Develop list of materials with recycled content that should be considered for use in the facility. Document preliminary strategy for use of recycled content materials in the **Sustainable Design Report**.	Finalize specifications for the use of materials with recycled content. Calculate the quantity of materials with recycled content specified using the LEED calculation method. List all CPG items and indicate whether or not the recycled content requirements are explicitly stated in the project specifications. If a waiver is being claimed for any of the materials specified, the A/E needs to complete the affirmative procurement waiver form and submit it to the PM. Document compliance with the CPG guidelines and LEED calculation in the Sustainable Design Report.	Discuss goal for maximizing use of materials with recycled content in the pre-bid conference. Encourage contractor to choose options that will increase recycled content of materials, provided that quality remains equal.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide specifications and contractor submittals highlighting recycled content materials installed. AND Provide a spreadsheet of all materials used on the project highlighting recycled content materials. Include the percentage of post-consumer and post-industrial recycled content for all recycled content materials, the costs of all materials for the projects, and calculations demonstrating that 25% of building materials have the required percentage of recycled contents. If a CPG listed product was specified that could not be obtained, the Contractor needs to fill out the affirmative procurement waiver form and submit it to the PM.	–	Review performance of recycled content materials to verify that performance is equal or superior to conventional materials and products.

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4.2		Specify an additional 25% (50% total) of building materials that contain in aggregate a minimum weighted average of 20% post-consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material.	1	**recommended**	See above. Ability to provide 50% of materials with recycled content will vary depending on building type, and location.		See above		See above	See above	See above	See above	See above	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide specifications and contractor submittals highlighting recycled content materials installed. AND Provide a spreadsheet of all materials used on the project highlighting recycled content materials. Include the percentage of post-consumer and post-industrial recycled content for all recycled content materials, the costs of all materials for the projects, and calculations demonstrating that 50% of building materials have the required percentage of recycled contents.		see above
Materials and Resources Credit 5.1: Local / Regional Materials	Increase demand for building products that are manufactured locally, reducing the environmental impacts resulting from transportation, and supporting the local economy.	Specify a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles.	1	**highly recommended**	Use of local and regionally sourced and manufactured materials reduces transportation requirements, and usually reduces cost as well. When integrated into decision making early in design, use of regionally sourced and manufactured materials can be accommodated in nearly all parts of the US.		Identify use of local / regional materials as a project goal.				Develop list of regionally manufactured materials that should be considered for use in the facility. Document preliminary strategy for use of regionally manufactured materials in the **Sustainable Design Report**.	Finalize specifications for the use of regionally manufactured materials, and calculate the quantity used based on the LEED calculation method. Describe strategy in the **Sustainable Design Report.**	Describe requirement for local / regional materials in the pre-bid conference.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide specifications and contractor submittals highlighting local materials used. **AND** Provide a spreadsheet of all materials used on the project highlighting locally manufactured materials. Include the location of the material manufacturer, the distance from the manufacturer to the project site, the costs of all materials for the project, and calculations demonstrating that 20% of building materials are manufactured within 500 miles of the project.		
5.2		Of those regionally manufactured materials, specify a minimum of 50% that are extracted, harvested, or recovered within 500 miles.	1	**recommended**	See above. Ability to meet LEED requirement will vary depending on location.		See above				Develop list of regionally manufactured materials that are made from regionally available resources that should be considered for use in the facility. Document preliminary strategy for use in the **Sustainable Design Report**.	Finalize specifications for the use of regionally manufactured materials made from regionally available resources, and calculate the quantity used based on the LEED calculation method. Describe strategy in the **Sustainable Design Report.**	Describe requirement for local / regional materials made from regionally available resources in the pre-bid conference.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide specifications and contractor submittals highlighting local materials used. **AND** Provide a spreadsheet of all materials used on the project highlighting locally manufactured materials. Include the location of the material manufacturer, the distance from the manufacturer to the project site, the costs of all materials for the project, and calculations demonstrating that 20% of building materials are manufactured within 500 miles of the project. **AND** Provide manufacturer information on locally manufactured materials demonstrating that 50% of these materials were extracted, harvested, or recovered within 500 miles of the project.		

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Materials and Resources Credit 6: Rapidly Renewable Materials	Reduce the use and depletion of finite raw and long cycle renewable materials by replacing them with rapidly renewable materials.	Specify rapidly renewable building materials for 5% of total building materials.	1	**conditionally recommended**	Use of rapidly renewable materials (straw, bamboo, some types of wood, etc) reduces environmental impacts, and may help meet the requirements of Executive Order 13101, guidance that encourages increased use of biobased products. However, these materials are not appropriate for all building types and availability is limited.		During programming, identify use of rapidly renewable materials as a project goal.				Explore opportunities to use rapidly renewable materials in the facility. Document preliminary list of rapidly renewable materials in the **Sustainable Design Report**.	Finalize specifications for the use of rapidly renewable, and calculate the quantity used based on the LEED calculation method. Describe strategy in the **Sustainable Design Report.**		Provide written documentation from the manufacturer, declaring the rapidly renewable materials contained in the candidate products. **AND** Provide specifications and contractor submittals highlighting rapidly renewable materials installed. **AND** Provide a spreadsheet of all materials used on the project highlighting rapidly renewable materials. Include manufacturer information, the costs of all materials for the project, and calculations demonstrating that 5% of building materials are rapidly renewable.		Review performance of rapidly renewable materials to verify that performance is equal or superior to conventional materials and products.
Materials and Resources Credit 7: Certified Wood	Encourage environmentally responsible forest management.	Use a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council guidelines for wood building components including but not limited to framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian bridges.	1	**recommended**	Use of certified sustainable wood is environmentally beneficial and imposes only a nominal installed cost premium compared to conventional wood installations.		During programming, identify use of FSC certified wood as a project goal.				Identify all likely applications for use of wood in the facility (structure, substrate, flooring, built-ins etc.), and explore options for FSC certified suppliers. Document findings in the **Sustainable Design Report**.	Consider availability of FSC-certified wood, when selecting species, cut and grade of wood for use in the facility. Develop specifications that require FSC-certified material, including chain-of-custody documentation. Identify goal for the percentage of wood material in the project that will be FSC-certified and document it in the **Sustainable Design Report.**	Discuss requirement for FSC-certified wood in the pre-bid conference, and identify if as a potential long lead time item.	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide wood certification documentation, including chain-of-custody documentation, from the manufacturer declaring conformance with Forest Stewardship Council Guidelines for certified wood building components. **AND** Provide specifications and contractor submittals highlighting certified wood-based materials installed. **AND** Provide a spreadsheet of all wood-based materials used on the project highlighting certified wood-based materials. Include calculations demonstrating that 50% of wood based materials are certified wood.		

Indoor Environmental Quality (IEQ)

IEQ Prerequisite 1: Minimum IAQ Performance	Establish minimum IAQ performance to prevent the development of indoor air quality problems in buildings, maintaining the health and well being of the occupants.	Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality and approved Addenda.	LEED req	**highly recommended**	This standard represents best practices widely accepted by industry. The new 1999 version of the standard provides greater flexibility for designers to meet the standard, than the previous 1989 version. It has been well documented that improved indoor air quality contributes to well-being and productivity in the workplace.		Document LEED referenced ASHRAE standard in the project program. Provide written justification if standard is not adopted.	Evaluate ambient air quality on the site, to determine if all or part of the site is subject to potential air quality problems from heavy traffic or nearby emissions sources. Review ambient air quality data and local wind patterns, and engage in on-site air quality testing if local sources of contamination are significant.		Document requirement to meet the ASHRAE 62-1999 standard in the SOW.	Locate fresh air intakes away from possible sources of contamination, including loading dock, cooling towers, and exhaust air vents. Identify ventilation rates, and ensure that HVAC system is sized adequately to meet air change requirements at all times, Document design approach to ensure good indoor air quality in the **Sustainable Design Report.**	Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a letter from the mechanical engineer stating compliance with ASHRAE 62-1989. AND Declare the ASHRAE 32-1989 procedure employed in the IAQ analysis (Ventilation Rate procedure or Indoor Air Quality Procedure) and include design criteria and assumptions.		Coordinate commissioning plan with Indoor Air Quality requirements, to ensure that IAQ goals are met. **(See Energy & Atmosphere: Prerequisite 1 and Credit 3)**	Follow operations and maintenance plan developed during the commissioning phase to ensure proper functioning of all IAQ strategies. **(See Energy & Atmosphere: Prerequisite 1 and Credit 3)**	Coordinate measurement and verification plan with IAQ requirements to ensure proper functioning of IAQ strategies over time. **(See Energy & Atmosphere: Credit 5)**

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IEQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control	Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).	Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR, by providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room shall be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable structural deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 Pa (0.03 inches of water gauge). Performance of smoking rooms shall be verified using tracer gas testing methods as described in ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results	required	**required**	Smoking is not permitted in US Government facilities.		Identify requirement for facility to be a "no smoking" facility in the project program.			Identify requirement for a no-smoking facility.		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide a letter from the building owner verifying the building policy prohibiting smoking. Include site drawing highlighting designated outdoor smoking areas if applicable. **OR** (See LEED for criteria regarding smoking rooms)				
IEQ Prerequisite 3 (AF Amendment): Acoustics and Noise Control	**AF Amendment:** Protect building occupants from exposure to excessive noise.	**AF Amendment:** Comply with applicable regulatory guidance governing noise, including the federal Occupational, Safety and Health Act (OSHA), which sets limits on noise levels in certain types of workplaces, and local laws that regulate noise levels of various land uses.	required	**required**	Poor acoustics and excessive noise are detrimental to health and productivity. **AND** Compliance with OSHA and related local laws is a mandatory regulatory requirement.	Consider ambient noise during site selection.	Identify regulations governing noise that are legally mandated (including OSHA and related local laws) as project requirements.	Coordinate noise control plan with EIAP.		Document regulations governing noise that are legally mandated (including OSHA and related local laws) in the SOW.	Develop site design that separates noise producing land uses (e.g. loading docks, mechanical equipment, manufacturing operations, artillery testing areas, and food prep areas) and activities from noise sensitive land uses and activities such as office space and living areas.	Develop design strategies to control the transmission of noise where noise cannot be avoided, or adequate separation is not possible. Consider use of earthen berms, high performance glazing systems, acoustically absorptive surfaces, etc. **AND** Summarize design strategies for noise control and document compliance with laws governing noise in the **Sustainable Design Report.**				Assess acoustics and noise control strategies in the building and on the site.
IEQ Credit 1: Carbon Dioxide (CO_2) Monitoring	Provide capacity for indoor air quality (IAQ) monitoring to sustain long term occupant health and comfort.	Install a permanent carbon dioxide (CO2) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time.	1	**conditionally recommended**	CO2 monitoring verifies that air quality is maintained, and can contribute to energy efficiency, especially when occupancy is highly variable. This may not be a cost-effective strategy in facilities that have very low occupancy.		Review program requirements to determine occupant density, and to estimate variability of occupancy over time. In buildings with wide variation in occupancy schedules, and with spaces that are occupied at a density greater than 1 person per 50 SF, use of CO_2 monitoring is recommended.			Document strategy regarding CO2 monitoring in the **Sustainable Design Report**.		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** Provide drawings, specifications and cut sheets highlighting the installed carbon dioxide monitoring system. Include a narrative describing initial operation set point parameters and the sequence of operation and control of building ventilation systems (if applicable).		Verify that CO_2 monitoring system is included in the commissioning plan.	Follow operations and maintenance plan developed during the commissioning phase to ensure proper functioning of CO_2 monitoring systems. **(See Energy & Atmosphere: Prerequisite 1 and Credit 3)**	Coordinate measurement and verification plan with CO_2 monitoring requirements to ensure proper functioning over time. **(See Energy & Atmosphere: Credit 5)**
IEQ Credit 2: Increase Ventilation Effectiveness	Provide for the effective delivery and mixing of fresh air to building occupants to support their health, safety, and comfort.	For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (E) greater than or equal to 0.9 as determined by ASHRAE 129-1977. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.	1	**conditionally recommended**	Ventilation effectiveness contributes to a healthy indoor environment. The LEED ventilation criteria can be met in buildings with underfloor air distribution systems, and in buildings with naturally ventilated systems with effective cross-ventilation patterns. Standard ceiling supply and return air systems do not meet this criteria.		Identify effective ventilation strategies as a project goal. Encourage consideration of design solutions that minimize the possibility for short-circuiting between supply and return air.			Determine whether ventilation system will be natural, mechanical or mixed-mode. Explore strategies that promote highly effective ventilation, including displacement ventilation. Describe ventilation strategy in the **Sustainable Design Report**.		Document compliance with LEED criteria in appendix to the **Sustainable Design Report:** For mechanically ventilated buildings, provide a report summarizing test results and calculations demonstrating that the designed building has an air-change effectiveness value of 0.9 or greater as determined by ASHRAE 129-1997, Appendix B. If E is less than 0.9, provide documentation indicating the corrected design ventilation rate (CDVR) used in the system design. **OR** For mechanically ventilated buildings, provide a design narrative that describes compliance with the recommended design approach in ASHRAE Fundamentals Chapter 31, Space Air Diffusion design as described in the calculation details of this credit.		Verify that ventilation system is included in the commissioning plan.	Follow operations and maintenance plan developed during the commissioning phase to ensure proper functioning of ventilation systems.	

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IEQ Credit 3: Construction IAQ Management Plan	Prevent indoor air quality problems resulting from the construction / renovation process, to sustain long term installer and occupant health and comfort	Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:												Document compliance with LEED criteria in appendix to the **Sustainable Design Report:**		
3.1		During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, AND protect stored on-site or installed absorptive materials from moisture damage, AND replace all filtration media immediately prior to occupancy (Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999).	1	**highly recommended**	The LEED referenced Indoor Air Quality Management Plan represents a "best-practice" approach to protecting indoor air quality during construction.		Document requirement for LEED referenced Indoor Air Quality Management Plan in the project program, as a pro active measure to protect indoor air quality in the completed facility. Provide written justification if criteria are not adopted.		Request that A/E identify individual on the team with documented experience in the development of Indoor Air Quality Management Plan.			Develop specification section detailing construction phase requirements to protect IAQ from contamination, including continuous ventilation during construction (after building is enclosed), and sequence of finishes installation, and other provisions as stated in LEED criteria.	Describe construction phase IAQ requirements in the pre-bid conference.	Provide a copy of the Construction IAQ Management Plan highlighting the five requirements of SMACNA IAQ Guideline for Occupied Buildings under Construction 1995, Chapter 3. **AND** Provide photographs of construction IAQ management measures such as protection of ducts and on-site stored or installed absorptive materials. **AND** Provide cut sheets of filtration media used during construction and installed immediately prior to occupancy with MERV values highlighted.		
3.2		Conduct a minimum two-week building flushout with new filtration media at 100% outside air after construction ends and prior to occupancy, **OR**, conduct a baseline indoor air quality testing procedure consistent with current EPA protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445.	1	**highly recommended**	The LEED referenced Flush -Out or Baseline IAQ Testing represents two options for ensuring that indoor air quality is acceptable prior to occupancy, that are highly recommended. Baseline IAQ testing provides the added value of a baseline to compare to future IAQ investigations.		Document requirement for building flush-out or baseline indoor air quality testing in the project program. Baseline IAQ testing is the recommended option for buildings over 50,000 SF in size that have successfully specified low-emission building materials and products. Provide written justification if neither of the methods is adopted.		See above			Develop specifications for building flush-out or Baseline IAQ testing.	Describe selected method for ensuring good IAQ in the completed facility -- flush-out or baseline IAQ testing -- in the pre-bid conference.	Provide a letter from the architect or engineer describing building flush-out procedures including actual dates of building flush-out. **OR** Provide specifications and documentation demonstrating conformance with IAQ testing procedures and requirements as described in the referenced standard.		Engage in periodic indoor air quality testing, to compare to baseline IAQ testing.
IEQ Credit 4: Low-Emitting Materials	Reduce the quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and occupant health and comfort.	Meet or exceed the VOC limits for adhesives, sealants, paints, composite wood products, and carpet systems as follows:					During the programming phase, identify use of "low-emission " materials as a project requirement. Provide written justification if this requirement is not adopted.				Document low VOC requirements in the outline specification.	Document low-emission product selections in the **Sustainable Design Report:**		Document compliance with LEED criteria in the **Sustainable Design Report:**		
4.1		- Adhesives must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168, **AND** all sealants used as a filler must meet or exceed Bay Area Air Resources Board Reg. 8, Rule 51	1	**highly recommended**	Use of low-emitting materials is part of a pro-active approach to maintaining good indoor air quality. Materials meeting the LEED criteria are readily available, have no adverse impact on performance, and little or no impact on cost.		see above				see above	Document low-emission product selections: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each adhesive and each sealant used in the building highlighting VOC limits		Update cut sheets and MSDS for adhesives and sealants based on actual products used during construction. Verify that all substitutions comply with requirements.	Use low-VOC adhesives and sealants for maintenance projects.	
4.2		- Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements.	1	**highly recommended**	see above		see above				see above	Document low-emission product selections: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each paint or coating used in the building highlighting VOC limits and chemical component limits.		Update cut sheets and MSDS for paints and coatings based on actual products used during construction. Verify that all substitutions comply with requirements.	Use low-VOC paints and coatings maintenance and periodic repainting.	
4.3		- Carpet systems must meet or exceed the Carpet and Rug Institute green Label Indoor Air Quality Test Program	1	**highly recommended**	see above		see above				see above	Document low-emission product selections: Provide a cut sheet for each carpet used in the building highlighting VOC limits.		Update cut sheets for carpet based on actual products used during construction. Verify that all substitutions comply with requirements.		
4.4		- Composite wood or agrifiber products must contain no added urea-formaldehyde resins	1	**highly recommended**	see above		see above				see above	Provide a cut sheet for each composite wood or agrifiber product used in the building highlighting urea-formaldehyde resin limits.		Update cut sheets wood and agrifiber products based on actual products used during construction. Verify that all substitutions comply with requirements.		

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IEQ Credit 5: Indoor Chemical and Pollutant Source Control	Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.	Design to minimize cross-contamination of regularly occupied areas by chemical pollutants: Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying /print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.	1	**highly recommended**	Careful design and operation of buildings to isolate and ventilate sources of contamination is a pro-active approach to maintaining good indoor air quality. The cost of these measures is minimal, and integration of these design features can be accommodated in all types and sizes of buildings.		Identify indoor chemical and pollution source control as a requirement in the program document. Provide written justification if requirement is not adopted.				Describe approach to indoor chemical and pollutant source control in the **Sustainable Design Report.** Identify all program areas that will contain potential building contaminants (including janitor's closets, housekeeping supply rooms, and high volume print rooms), and describe ventilation strategy proposed to isolate and ventilate contaminants. Strategy should comply with LEED criteria at a minimum.	Document compliance with LEED criteria in the Sustainable Design Report: Provide drawings and cut sheets highlighting entry way systems, including locations of entry ways in the building. AND Provide a narrative and drawings highlighting the deck-to-deck physical separation and independent ventilation system of chemical use areas and copy rooms. AND Provide a narrative and drawings highlighting the plumbing system employed in chemical mixing areas.		During commissioning, verify pressure relationships between occupied spaces and spaces with potential building contaminants.	Develop cleaning and maintenance program using nontoxic, low-VOC cleaning products. See EPA's "Cleaning Products Pilot Project" for guidance.	Review changes to space utilization to determine if program areas that contain potential building contaminants have moved, or been added. Verify that all spaces containing potential contaminants are located in appropriately designed space, per LEED requirement.
IEQ Credit 6.1: Controllability of Systems	Provide a high level of individual occupant control of thermal, ventilation, and lighting systems to support optimum health, productivity, and comfort conditions.	Provide a minimum of one operable window and one lighting control zone per 200 s.f. for all occupied areas within 15 feet of the perimeter wall.	1	**conditionally recommended**	Individual occupant control of thermal, ventilation, and lighting systems support well-being and productivity. However the benefit must be weighed against the cost. Individual controls in the perimeter zone provide the most benefit in closed office environments.		Review occupancy types to assess the value of investing in operable windows and individual occupant controls for lighting in the perimeter zone. Identify as a project goal, where appropriate.				Explore potential strategies to provide operable windows and individual control of lighting in the perimeter zone. Describe approach in the **Sustainable Design Report**.	Document compliance with LEED criteria in the Sustainable Design Report: For perimeter regularly occupied areas, provide drawings and cut sheets highlighting operable windows and lighting controls for perimeter areas of the building. Include calculations summarizing the total perimeter area and number of operable windows and lighting controls.		During commissioning, verify functioning of occupant controlled lighting systems.	Monitor use of operable windows to ensure energy efficiency or proper functioning of HVAC systems is not compromised. **AND** Follow operations and maintenance plan developed during the commissioning phase to ensure proper functioning of occupant controlled systems.	Coordinate measurement and verification plan with operable windows and occupant controlled systems to ensure proper functioning over time.
6.2		Provide controls for each individual for airflow, temperature, and lighting for 50% of the non perimeter, regularly occupied areas.	1	**conditionally recommended**	Individual occupant control of thermal, ventilation, and lighting systems support well-being and productivity. However the benefit must be weighed against the cost.		Review occupancy types, to assess the value of investing in individual occupant controls for temperature, airflow and lighting in the interior zone. Identify as a project goal, where appropriate.				Explore potential strategies to provide individual control of airflow, temperature and lighting in the interior zone. Describe approach in the **Sustainable Design Report**.	For non-perimeter regularly occupied areas, provide drawings and cut sheets highlighting airflow, temperature, and lighting controls. Include calculations summarizing the total non-perimeter occupied area, number of occupants, and number of airflow, temperature, and lighting controls.		During commissioning, verify occupant controlled systems for temperature, airflow and lighting, and their interface with mechanical systems.	Follow operations and maintenance plan developed during the commissioning phase to ensure proper functioning of occupant controlled systems.	Coordinate measurement and verification plan with occupant controlled systems to ensure proper functioning over time.
IEQ Credit 7.1: Thermal Comfort	Provide for a thermally comfortable environment that supports the productive and healthy performance of the building occupants.	Comply with ASHRAE Standard 55-1992, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone.	1	**recommended**	Adoption of thermal comfort standards improves comfort and productivity, however maintaining optimal temperature and humidity in a building can increase the HVAC load, and increase construction costs as well. Use of this standard is most beneficial for buildings in climates with humidity extremes and occupants that spend the majority of the day in the building.		During programming review occupancy types, and humidity control requirements of the LEED referenced ASHRAE standard 55-1992, with addenda 1995. Identify standard as a design requirement for buildings in climates with humidity extremes, and occupants that spend the majority of the day in the building.				Review LEED referenced ASHRAE standard and weather charts to determine whether humidification and/or dehumidification will be required. Document findings in the **Sustainable Design Report.**	Document compliance with LEED criteria in the Sustainable Design Report: Provide a letter from engineer confirming that the project complies with the ASHRAE Standard 55-1992, Addenda 1995. Include design criteria and assumptions for thermal comfort including temperature, humidity, an air movement ranges.		Coordinate commissioning plan with Thermal Comfort requirements, to ensure that goals are met.		
7.2		Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/ or dehumidification systems in the building.	1	**conditionally recommended**	Monitoring is the best method for ensuring that temperature and humidity requirements are being met. Humidity monitors can also be used to alert building operations personnel to unusual sources of moisture, thereby avoiding possible mold and mildew. The cost of monitoring must be balanced against the benefits.						If humidification /dehumidification is required, consider the use of a permanent temperature and humidity monitoring system. Document findings in the **Sustainable Design Report.**	Document compliance with LEED criteria in the Sustainable Design Report: Provide drawings, specifications and cut sheets highlighting the installed permanent temperature and humidity monitoring and control system. Include a narrative describing measurement points and operator interface.		Include permanent temperature and humidity monitoring and control system in list of equipment included in commissioning scope.	Follow operations and maintenance plan developed during the commissioning phase to ensure proper functioning of temperature and humidity monitoring system.	

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IEQ Credit 8.1: Daylight and Views	Provide a connection between indoor spaces and the outdoor environment through the introduction of sunlight and views into the occupied areas of the building.	Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight.	1	**highly recommended**	Daylighting contributes to energy efficiency, as well as occupant well-being and productivity. Close coordination of architecture, interior space planning with daylighting strategy is required. Daylighting goals need to be balanced against space planning efficiency goals. **NOTE:** potential conflict with *Anti-terrorism Guidelines.*	Budget for daylighting analysis for all office buildings greater than 50,000 SF. Cost will vary based on size and complexity of prject, however in daylighting analysis generally adds between $0.10 to $0.20 per SF to the fee.			Request that architect demonstrate experience developing integrated daylighting solutions.	Require daylighting calculations in SOW. For larger facilities greater than 50,000 SF with potential for complex daylighting solutions, require a scale study model to evaluate daylighting solutions.	Develop site orientation, massing and plan organization to promote the use of daylighting. Document daylighting strategy in **Sustainable Design Report**.	Document compliance with LEED criteria in the Sustainable Design Report: Provide drawings with a narrative highlighting critical visual task areas and typical room sections highlighting shading devices for direct sun control. **AND** Submit glazing cut sheets highlighting T_{vis} values (e.g. visible light transmission) and area calculations defining the daylight zone and daylight prediction calculations demonstrating a minimum Daylight Factor of 2% in these areas. **OR** Submit glazing cut sheets highlighting T_{vis} values and area calculations defining the daylight zone and daylight simulation results demonstrating a minimum Daylight Factor of 2% in those areas.		Include shading and sun control devices in list of equipment included in commissioning scope.		
8.2		Direct line of sight to vision glazing from 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas.	1	**recommended**	Views provide a connection between the indoor and the outdoor environment. Access to views impacts occupant well-being and productivity. Close coordination of architecture and interior space planning is required, and the goal to provide views needs to be balanced against space planning efficiency goals.		Identify access to views as a design goal.				Develop site orientation, massing and plan organization to promote views to the outside. Document daylighting strategy in **Sustainable Design Report**.	Document compliance with LEED criteria in the Sustainable Design Report: Provide drawings and a narrative highlighting direct line of sight zone. Submit calculations demonstrating that 90% of these zones have direct lines of site to perimeter glazing.				Periodically review space planning to determine if adjustments have to be made to maintain views from all regularly occupied areas.
Innovation & Design Process																
Innovation & Design Process Credit 1:	To provide design teams and projects the opportunity to be awarded points for exceptional performance above requirements set by the LEED Green Building Rating System and/or innovative performance in green building categories not specifically addressed by the LEED Green Building Rating System.	In writing, using the LEED Credit Equivalence process, identify the intent of the proposed innovation credit, the proposed requirement for compliance, the proposed submittals to demonstrate compliance, and the design approach used to meet the required elements.	1	**conditionally recommended**	Innovative design solutions can add value to the project, however these options must be evaluated on a case by case basis. Innovative solutions must support the overall mission of the facility.							Identify potential innovation credit(s) in the **Sustainable Design Report**.	Discuss design strategies eligible for innovation credit(s) in the pre-bid meeting.	Provide a narrative and supporting documents (e.g. drawings, specifications, and cut sheets) for EACH innovative measure incorporated into the project. Include information that demonstrates the sustainable benefits of each measure. Document innovation credit in the **Sustainable Design Report.**		
Innovation & Design Process Credit 2: LEED Accredited Professional	To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.	At least one principal participant of the project team that has successfully completed the LEED Accredited Professional exam.	1	**highly recommended**	LEED Accredited Professionals add value to the design effort because they understand the integrated design process and are familiar with high-performance sustainable design solutions.				Request that prospective A/E consultants identify LEED Accredited Professionals on the team.			Identify LEED Accredited Professional on the team in the **Sustainable Design Report**.		Provide a copy of the LEED Accredited Professional Certificate in the **Sustainable Design Report**.		
Innovation & Design Process Credit 3 (AF Amendment): Integrated Landscape Management	**AF Amendment:** Restore habitat areas through a comprehensive approach to landscape design and long-term management.	**AF Amendment:** Develop an integrated design and management plan to restore habitat and improve ecosystem health. Plan must include native plant selection; EPA approved non-chemical fertilizers, application procedures and rates; integrated pest management (IPM) plan; mulching, pruning and mowing practices; maximum tree size; optimum ground cover height; and composting methods.	1	**recommended**	Integrated design and management of landscaped areas reduces maintenance costs over time and improves ecosystem health.		Identify integrated landscape design and management as a goal during the programming phase	Coordinate integrated landscape design and management plan with the EIAP process	Request that the A/E team include a Landscape Architect with demonstrated experience in integrated landscape design and management to restore habitat and ecosystem health.		Integrate landscape design with stormwater management strategy.	Develop design and specifications based on native plant selection, and identify appropriate composting area on site. Define landscape management plan requirements in the specifications. Document in the **Sustainable Design Report.**	Select landscaping subcontractor with experience in restorative landscape management.	Develop long-term landscape management plan and document native plant selection in the **Sustainable Design Report.**	Provide ongoing landscape management using only EPA approved non-chemical fertilizers, integrated pest management (IPM) plan; periodic mulching and pruning, and composting.	Monitor landscape practices to ensure that landscape management plan is being implemented.
Innovation & Design Process Credit 4 (AF Amendment): Deconstruction	**AF Amendment:** Extend the useful life of building materials and reduce construction and demolition waste.	**AF Amendment:** Employ deconstruction methods to dismantle an existing building, and reuse a minimum of 50% of the materials by weight.	1	**recommended**	Deconstruction can be a highly cost-effective and resource efficient solution.	Consider opportunity to deconstruct and reuse existing facilities, and budget accordingly.		Coordinate deconstruction plan with EIAP.	Where project involves potential reuse of an existing structure, request that A/E team demonstrate experience with deconstruction and re-use projects. Process Mapping		Survey materials available for reuse from deconstruction of existing building, and develop design solution based on reuse the greatest extent practicable.	Describe strategy for deconstruction and re-use, and provide calculation for percentage of existing materials that can be reused by weight, in the **Sustainable Design Report.**	Describe plan for deconstruction and reuse in the pre-bid meeting.	Identify holding areas for deconstructed materials, and test structural materials. Document reuse of materials by weight in the **Sustainable Design Report.**		

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Innovation & Design Process Credit 5 (AF Amendment): Advanced Resource Efficiency	**AF Amendment:** Extend the useful life of building materials, and reduce time required to accommodate change.	**AF Amendment:** Incorporate mobile building components with an interior design master plan to maximize flexibility for future uses.	1	**recommended**	Design for flexibility reduces facility down time, and reduces life cycle cost. ***Note :*** potential synergy with *Anti-terrorism Guidelines.*		Define flexibility needs during the programming phase. Identify expected life span of current use, rate of churn (internal reorganization with same users), and possible needs to accommodate deferent uses in the future.		Request that A/E team demonstrate experience in the development of highly flexible facilities.		Develop interior design master plan based on anticipated future uses. Develop modular design concept design to maximize flexibility and document in the **Sustainable Design Report.**	Document design solution to maximize flexibility in the Sustainable Design Report.				Evaluate success in accommodating change over time.